Trend Study 6-3-01

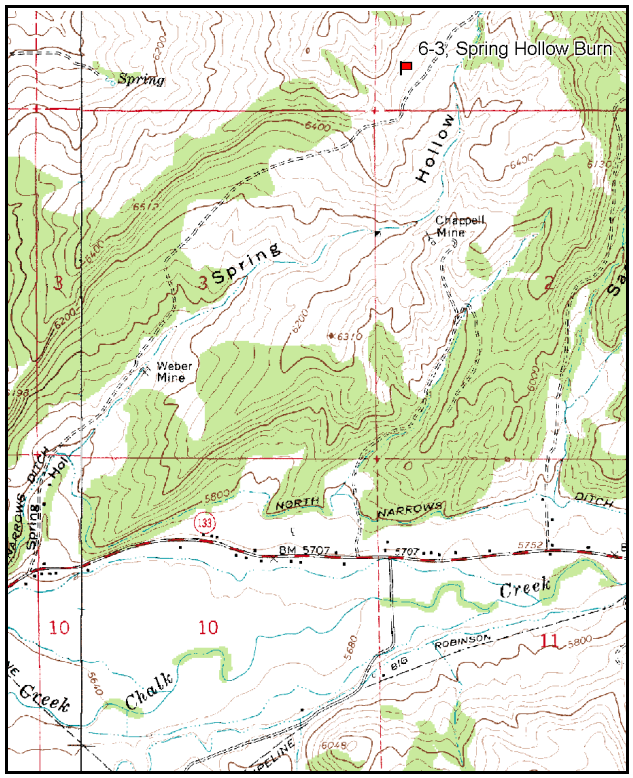
Study site name: Spring Hollow Burn . Vegetation type: Big Sagebrush-Grass .

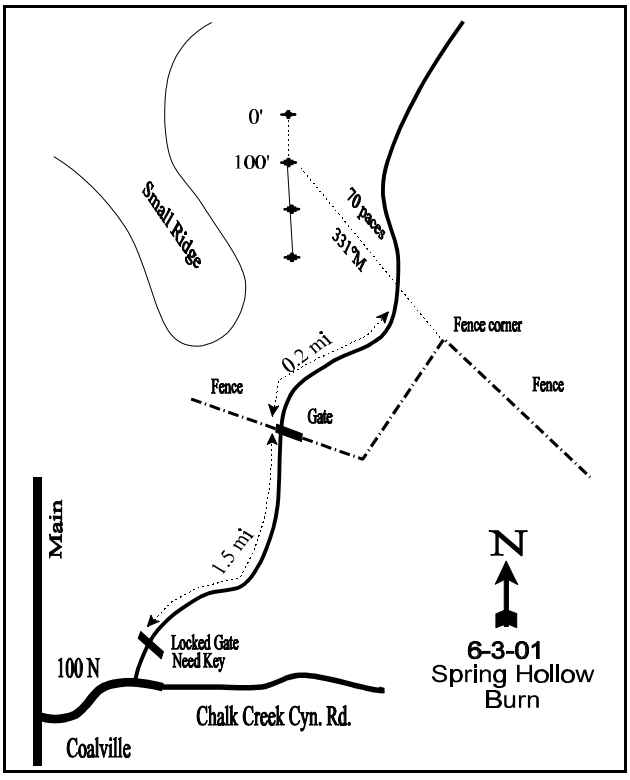
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: Line 1 (11 & 95ft), line 2 (34 & 71ft), line 3 (59ft).

LOCATION DESCRIPTION

From 100 North and Main in Coalville, travel east 1.3 miles to Spring Hollow Road. Turn left (northeast) and proceed 0.2 mile to a locked gate. Proceed through gate, and continue 1.5 miles to a gate. Continue 0.2 miles to a fence line corner on the right. From corner post, walk 70 paces at 331 degrees magnetic to the 100-foot stake of the baseline. The 0-foot stake is marked by browse tag #7974.





Map Name: Turner Hollow

Diagrammatic Sketch

Township 3N , Range 5E , Section 35

UTM 4532493 N 469930 E

DISCUSSION

Trend Study No. 6-3

The Spring Hollow Burn study is located on an old burn in the upper part of Spring Hollow, which was placed near a old line intercept study. This site was not read in 1996 because the landowner would not give us permission to go onto the property. However, permission was obtained to monitor the study in 2001. The area is deer winter range originally dominated by sagebrush-grass and juniper-pinyon communities. The area was subsequently seeded with perennial grasses, mostly crested and intermediate wheatgrass after the burn. The transect is located on a gently rolling, southeast-facing exposure at an elevation of 5,560 feet. This area is privately-owned and grazed by a variety of domestic animals in addition to winter use by deer and elk. During heavy winters this site may not be as critical for wildlife due to the lack of browse. In 1984, deer pellet groups occurred frequently, and 3 deer and 1 elk antler shed were found. In 2001, a pellet group transect read along the study baseline estimated 9 elk days use/acre (21 edu/ha), 6 deer days use/acre (15 ddu/ha), and 21 cow days use/acre (52 cdu/ha). Livestock were also observed near the site in 2001 when the study was monitored.

Soils are clay loam in texture, with a soil reaction that is slightly acidic (6.5 pH). Soil depth is quite shallow with an estimated effective rooting depth of less than 9 inches. The majority of the rock occurs in the upper portions of the profile. Organic matter is relatively high at 4.6%. Erosion is minimal due to the abundance of herbaceous vegetation cover, litter cover, and low percent bare ground. An erosion condition class assessment determined soils as stable in 2001.

Browse is very limited on the site providing only 2% average cover in 2001. Mountain big sagebrush and serviceberry are the most preferred species on the site. Both have densities estimated at 40 plants/acre or less. Both species show moderate to heavy use in 2001. Snakeweed is the most abundant species having an estimated density of 4,100 plants/acre in 2001. The sagebrush and serviceberry populations will remain minimal at this site due to high competition with crested wheatgrass for resources.

The herbaceous understory is dominated by crested wheatgrass, with Sandberg bluegrass being fairly abundant as well. Crested wheatgrass displayed moderate to heavy utilization over the entire site in 2001. It was reported in 1990 that grasses appeared less vigorous than at the line intercept study because of grazing effects and damage by ants and aphids. Forbs provided 15% of the vegetative cover on the site in 2001. Perennial species increased in sum of nested frequency between 1990 and 2001. Annuals, which were not sampled in 1984 or 1990, were also quite abundant in 2001.

1984 APPARENT TREND ASSESSMENT

Based on a rereading of the line intercept study, cover data from the 1984 study, and on-site reconnaissance, soil trend appears to be slowly improving and in fair condition. Vegetative trend is more difficult to assess. Although long-term trend may be toward an improving big sagebrush stand, it will likely be a very slow process. In the interim, the area will continue to be grass dominated and subject to sharp increases of undesirable shrubs in an irregular pattern.

1990 TREND ASSESSMENT

There is a significant increase in percent decadence in this low density, heavily used big sagebrush population. Also, the high density of snakeweed indicates a definite downward trend on this winter range. The site has an incredible infestation of ants and aphids on the sagebrush. In spite of these factors, the sagebrush display fair growth and seed production. No seedlings were found. Any openings in the dense crested wheatgrass stand that would allow young sagebrush to become established are crowded with snakeweed seedling and young. The dense stand of small crested wheatgrass plants had increased nested frequency values. It shows 40-60% utilization, and cattle are still in the area utilizing the fall green-up. Litter cover is fair. The percentage of cryptogamic cover decreased from 11 to 2%. There is evidence of some soil erosion.

TREND ASSESSMENT
soil - down (1)
browse - down (1)
herbaceous understory - stable (3)

2001 TREND ASSESSMENT

Trend for soil is stable. Soils have minimal erosion, vegetation and litter cover are well disbursed, and bare soil is moderately low. Trend for browse is stable, although browse is limited on the site with only 20 sagebrush and 40 serviceberry plants/acre being estimated in 2001. Due to the lack of dead sagebrush plants, the large decrease in sagebrush density since 1990 is due to the greatly increased sample size used in 2001 which more accurately estimates browse populations that have clumped and/or discontinuous distributions. Sagebrush is very patchy throughout the entire area. Recruitment by residual plants seems unlikely in the future due to competition with understory of crested wheatgrass. Snakeweed has a much lower density compared to 1984 and 1990 estimates. The population appears stable with an age class consisting of 94% mature plants. Trend for the herbaceous understory is slightly up due an increase in sum of nested frequency for perennial grasses and forbs.

TREND ASSESSMENT
soil - stable (3)
browse - stable but limited (3)
herbaceous understory - slightly up (4)

HERBACEOUS TRENDS --
Herd unit 06 , Study no: 3

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'84	'90	'01	'84	'90	'01	'01
G	Agropyron cristatum	a312	b348	b323	96	100	92	27.98
G	Agropyron dasystachyum	a10	a-	ab11	4	-	5	.67
G	Agropyron intermedium	a-	b9	ab5	-	5	3	.04
G	Agropyron spicatum	a5	a7	b46	4	3	16	2.08
G	Elymus cinereus	-	-	3	-	-	1	.03
G	Koeleria cristata	a14	a2	b44	7	1	18	.59
G	Poa bulbosa	-	-	9	-	-	4	.12
G	Poa fendleriana	-	5	-	-	2	-	-
G	Poa pratensis	1	-	8	1	-	4	.07
G	Poa secunda	a77	b214	b205	36	74	73	4.55
G	Stipa spp.	-	3	-	-	1	-	-
Total for Annual Grasses		0	0	0	0	0	0	0
Total for Perennial Grasses		419	588	654	148	186	216	36.16
Total for Grasses		419	588	654	148	186	216	36.16
F	Achillea millefolium	a3	a4	b20	1	2	8	.11
F	Agoseris glauca	a-	a-	b12	-	-	7	.04
F	Alyssum alyssoides (a)	-	-	42	-	-	20	.25
F	Allium spp.	a-	a-	b54	-	-	27	.18
F	Antennaria rosea	-	-	2	-	-	1	.03
F	Arabis spp.	-	4	-	-	2	-	-
F	Artemisia ludoviciana	4	8	8	1	3	3	.06
F	Aster chilensis	a7	a8	b60	3	3	20	1.82
F	Astragalus convallarius	-	-	2	-	-	1	.03
F	Astragalus spp.	a-	a-	b59	-	-	28	.39
F	Calochortus nuttallii	-	-	3	-	-	3	.01
F	Cirsium undulatum	5	3	4	4	1	3	.06
F	Collomia linearis (a)	-	-	34	-	-	16	.08
F	Collinsia parviflora (a)	-	-	98	-	-	38	.33
F	Descurainia pinnata (a)	-	-	6	-	-	2	.01
F	Draba spp. (a)	-	-	85	-	-	31	.18
F	Epilobium brachycarpum (a)	-	-	85	-	-	33	.46
F	Erodium cicutarium (a)	-	-	3	-	-	2	.01
F	Erigeron divergens	b124	a56	a46	48	25	22	.65
F	Holosteum umbellatum (a)	-	-	31	-	-	13	.09

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %
		'84	'90	'01	'84	'90	'01	'01
F	Lappula occidentalis (a)	-	-	9	-	-	4	.04
F	Lactuca serriola	-	-	8	-	-	3	.04
F	Lithospermum ruderale	$_{b}$45	$_{b}$42	$_{a}$8	22	20	4	.49
F	Lupinus argenteus	-	-	2	-	-	2	.06
F	Microsteris gracilis (a)	-	-	27	-	-	14	.11
F	Oenothera pallida	$_{b}$40	$_{b}$32	$_{a}$14	16	16	8	.23
F	Phlox longifolia	-	-	7	-	-	3	.01
F	Polygonum douglasii (a)	-	-	34	-	-	14	.07
F	Ranunculus testiculatus (a)	-	-	46	-	-	20	.15
F	Senecio integerrimus	-	-	2	-	-	2	.01
F	Sphaeralcea coccinea	-	4	4	-	2	3	.02
F	Tragopogon dubius	$_{a}$8	$_{a}$12	$_{b}$56	4	9	29	.42
F	Viguiera multiflora	-	1	-	-	1	-	-
F	Zigadenus paniculatus	$_{a}$-	$_{a}$-	$_{b}$13	-	-	7	.19
Total for Annual Forbs		0	0	500	0	0	207	1.80
Total for Perennial Forbs		236	174	384	99	84	184	4.89
Total for Forbs		236	174	884	99	84	391	6.70

Values with different subscript letters are significantly different at alpha = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 06 , Study no: 3

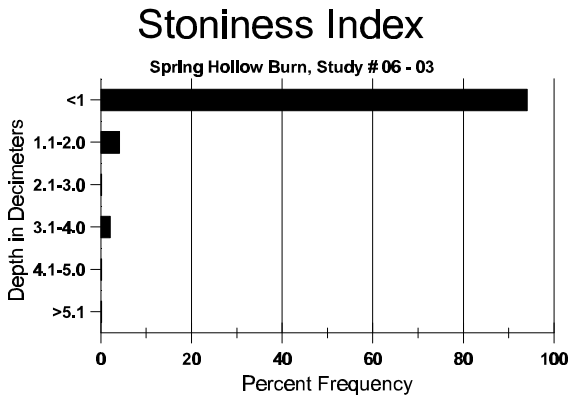
Type	Species	Strip Frequency '01	Average Cover % '01
B	Amelanchier alnifolia	2	.03
B	Artemisia tridentata vaseyana	1	.63
B	Chrysothamnus viscidiflorus viscidiflorus	8	.18
B	Gutierrezia sarothrae	63	1.19
B	Leptodactylon pungens	1	-
B	Opuntia spp.	3	-
B	Symphoricarpos oreophilus	1	-
Total for Browse		79	2.03

BASIC COVER --
Herd unit 06 , Study no: 3

Cover Type	Nested Frequency '01	Average Cover % '84	'90	'01
Vegetation	379	3.50	15.50	49.49
Rock	202	7.00	3.25	3.73
Pavement	317	11.50	15.75	6.90
Litter	372	49.50	43.25	43.11
Cryptogams	12	11.25	2.00	.07
Bare Ground	280	17.25	20.25	13.19

SOIL ANALYSIS DATA --
Herd Unit 06, Study no: 03, Spring Hollow Burn

Effective rooting depth (in)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
8.6	66.0 (12.0)	6.5	30.9	38.4	30.6	4.6	25.8	384.0	.9



PELLET GROUP FREQUENCY --
Herd unit 06 , Study no: 3

Type	Quadrat Frequency '01	Pellet Transect Pellet Groups per Acre ⁞01	Pellet Transect Days Use per Acre (ha) ⁞01
Rabbit	10	9	N/A
Horse	1	-	-
Elk	5	113	9 (21)
Deer	2	78	6 (15)
Cattle	16	252	21 (52)

BROWSE CHARACTERISTICS --
Herd unit 06 , Study no: 3

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	23	0
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	1	1	-	-	-	-	-	-	2	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'01	50%	50%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	0	Dec:		0%
'90	0			0%
'01	40			100%

Artemisia tridentata vaseyana																		
S	84	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	-	15	6	-	-	-	-	-	-	21	-	-	-	700	17	23	21
	90	-	7	4	-	-	-	-	-	-	-	11	-	-	366	23	36	11
	01	-	1	-	-	-	-	-	-	-	1	-	-	-	20	22	34	1
D	84	-	2	4	-	-	-	-	-	-	4	2	-	-	200			6
	90	-	6	4	-	-	-	-	-	-	1	8	1	-	333			10
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	59%	34%	00%	-28%
'90	62%	38%	05%	-97%
'01	100%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	966	Dec:		21%
'90	699			48%
'01	20			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	3	-	-	-	-	-	3	-	-	-	100			3
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	1	-	-	-	-	-	-	-	-	1	-	-	-	33	11	17	1
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33	12	11	1
	01	16	-	-	-	-	-	-	-	-	16	-	-	-	320	9	13	16
D	84	1	-	-	-	-	-	-	-	-	-	-	1	-	33			1
	90	4	1	-	1	-	-	-	-	-	4	-	-	2	200			6
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	50%	+80%
'90	10%	00%	20%	- 4%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'84	66	Dec:		50%
'90	333			60%
'01	320			0%

Gutierrezia sarothrae																		
S	84	43	-	-	-	-	-	-	-	-	43	-	-	-	1433			43
	90	29	-	-	-	-	-	-	-	-	29	-	-	-	966			29
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	124	-	-	-	-	-	-	-	-	124	-	-	-	4133			124
	90	239	1	-	-	-	-	-	-	-	232	7	1	-	8000			240
	01	11	-	-	-	-	-	-	-	-	11	-	-	-	220			11
M	84	486	-	-	-	-	-	-	-	-	486	-	-	-	16200	7	6	486
	90	242	2	-	-	-	-	-	-	-	243	-	1	-	8133	7	7	244
	01	193	-	-	-	-	-	-	-	-	191	2	-	-	3860	7	8	193
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	25	1	-	-	-	-	-	-	-	15	-	7	4	866			26
	01	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	-16%
'90	.78%	00%	03%	-76%
'01	00%	00%	.48%	

Total Plants/Acre (excluding Dead & Seedlings)			
'84	20333	Dec:	0%
'90	16999		5%
'01	4100		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60	-	-	3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	-
	'90	0		-
	'01	60		-

Opuntia spp.																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	84	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	90	6	-	-	-	-	-	-	-	-	6	-	-	-	200			6
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	11	-	-	-	-	-	-	-	-	11	-	-	-	366	3	3	11
	90	2	-	-	-	-	-	-	-	-	2	-	-	-	66	5	10	2
	01	3	-	-	-	-	-	-	-	-	3	-	-	-	60	4	9	3
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	1	-	-	-	-	-	-	-	-	-	-	1	-	33			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	-25%
'90	00%	00%	11%	-80%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	399	Dec:	0%
	'90	299		11%
	'01	60		0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	01	1	-	-	-	-	-	-	-	-	1	-	-	-	20	15	23	1
D	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	01	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'84	00%	00%	00%	
'90	00%	00%	00%	-39%
'01	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'84	0	Dec:	0%
	'90	33		100%
	'01	20		0%